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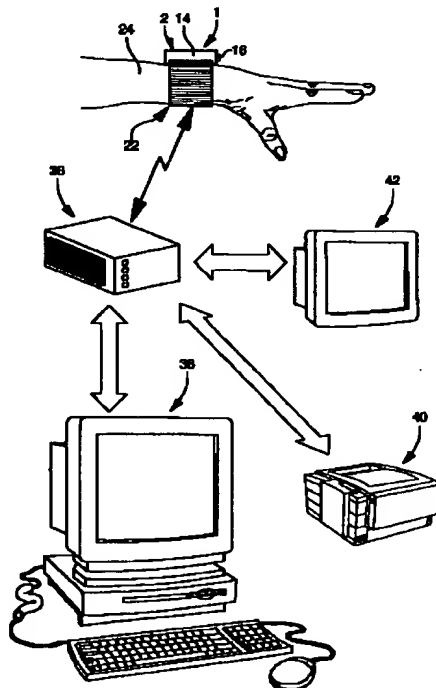
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(54)【発明の名称】 低電力消費の携帯用物体、特にカメラおよび無線データ伝送手段を含む時計

(57)【要約】

【課題】 電力消費が非常に低い携帯用物体、特にデジタル写真機と無線データ伝送手段を含む腕時計を提供する。

【解決手段】 本発明は、後でアナログ／デジタル変換器によってデジタル化され、次いでメモリ回路に記憶される写真を撮影するための写真機(30)を含む低電力消費の携帯用物体、特に腕時計(1)に関し、携帯用物体は、携帯用物体に記憶された画像に対応するデジタルデータ进行处理すると共に遠隔電子受信装置(36)へ無線送信するための電子モジュールをさらに含む。



【特許請求の範囲】

【請求項1】 アナログ／デジタル変換器（CAN1）によってデジタル化され、メモリ回路（MEM1）に記憶される写真を撮影するために、レンズ組立体（28）および画像センサ（SENS）を装備した装置（30）を含む低電力消費の携帯用物体において、その携帯用物体に記憶された画像に対応するデジタルデータの処理および遠隔電子受信装置（36）への無線伝送用の電子モジュール（34）を含むことを特徴とする携帯用物体。

【請求項2】 携帯用物体に記憶された画像に対応するデータの処理および無線伝送モジュール（34）が、データのデジタル圧縮計算を確実にするための専用アーキテクチャを有するデータ処理回路（COMP）を含むことを特徴とする請求項1に記載の携帯用物体。

【請求項3】 デジタル化されたデータがそれぞれDRAM型およびSRAM型のメモリ回路（MEM1、MEM2）に記憶されることを特徴とする請求項1から2のいずれか一項に記載の携帯用物体。

【請求項4】 ディスプレイセル（DISP）を含むことを特徴とする請求項1から3のいずれか一項に記載の携帯用物体。

【請求項5】 ディスプレイセル（DISP）がメモリ反射セルであることを特徴とする請求項4に記載の携帯用物体。

【請求項6】 画像センサ（SENS）がCMOS技術を使用することを特徴とする請求項1から5のいずれか一項に記載の携帯用物体。

【請求項7】 画像センサ（SENS）がアナログリンク（ANALOG）を介してディスプレイセル（DISP）に接続されることを特徴とする請求項4から6のいずれか一項に記載の携帯用物体。

【請求項8】 携帯用物体に記憶されたデータが無線周波数リンクを介して遠隔電子受信装置（36）に転送されることを特徴とする請求項1から7のいずれか一項に記載の携帯用物体。

【請求項9】 携帯用物体に記憶されたデータの無線周波数リンクを介しての転送が27MHzの周波数で実行されることを特徴とする請求項8に記載の携帯用物体。

【請求項10】 携帯用物体に記憶されたデータが赤外線リンクを介して遠隔電子受信装置（36）に転送されることを特徴とする請求項1から7のいずれか一項に記載の携帯用物体。

【請求項11】 携帯用物体に記憶されたデータの赤外線リンクを介しての転送が低速赤外範囲で実行されることを特徴とする請求項10に記載の携帯用物体。

【請求項12】 データ伝送がデジタル写真機（30）のレンズ組立体（28）を通して行われることを特徴とする請求項10または11のいずれか一項に記載の携帯用物体。

【請求項13】 電子モジュール（34）が遠隔電子装

置（36）によって送信されるメッセージを受信するための受信機（RECEIV）を含むことを特徴とする請求項1から12のいずれか一項に記載の携帯用物体。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は低電力消費の携帯用物体、特にデジタル写真機および無線データ伝送手段を含む時計に関する。

【0002】

【従来の技術】低電力消費の携帯用物体とは、一般的に1から10mAの範囲の電流に対し電力消費が約5から50mWである任意の種類の携帯用物体を意味する。内部にデジタル写真機が収容されたケースを含む腕時計などの時計はすでに知られている。したがって、そうした時計の着用者は永久的に利用可能な写真機を持ち、例えば風景、家族の成員、または仕事上の会議で会った人の写真を撮影することができる。いったん写真が撮影されると、それらはアナログ／デジタル変換器によってデジタル化され、メモリ回路に記憶される。記憶された写真は次に、遠隔電子処理および受信装置、従来はパーソナルコンピュータすなわちPCに転送しなければならない。この転送動作は、一端が時計に、他端がPCに接続された電気ケーブルによって行われる。例えば時計の一部によって行われるオーム接触により、画像転送ケーブルを後者に接続することができる。

【0003】この解決策は、電力消費の観点から経済的であるという利点がある。メモリに記憶された写真に対応するデジタルデータのワイヤ接続伝送は、非常に低い電流で行うことができる。さらに、この転送動作中、時計の電力供給は、一般的に主電源に接続されたコンピュータ自体によって確保することができる。逆に、ワイヤ伝送の主要な欠点は、転送ケーブルの接続に必要なオーム接触が時計の密閉に対して極めて有害であるという事実にある。この接触は実際には開口部を構成し、そこから湿気、水、およびゴミが容易に時計のケースに侵入し、時計の適切な動作を損ねる。デジタル写真機によって記憶された写真を画像信号の波形整形後に無線周波数リンクを介して離れたコンピュータへ転送する、多数の適用例もまた知られている。

【0004】例として、タクシーなど人々を輸送する車両用の安全システムを開示する、Serel Franceによって出願された欧州特許第0680818号を引用することができる。このシステムでは、写真カメラからのアナログ信号はデジタルデータに変換され、圧縮され、次に無線送信機によって中央タクシー局に送信される。中央局では、デジタル信号が無線受信機によって捕捉され、次に受信機の出力側に配置された復号器によって復号される。最後に画像はテレビモニタに表示される。このシステムは、タクシーが乗客を乗せたときにその写真を撮影することができ、都合がよい。輸送が無事

に行われ、乗客が料金を支払うと、その写真は削除される。しかし、無線周波数電波によるそのような通信システムは、大量の電流を消費するという欠点がある。これは、そうした解決策が、例えば電力の確保が制限される腕時計型の携帯用物体に今日まで使用されてこなかった理由を説明する。タクシーの場合、車両の電池は、写真機および無線周波数電波データ伝送手段の電源を確保できる十分に大きい電力貯蔵能力を持つ。

【0005】

【発明が解決しようとする課題】本発明の目的は、電力消費が非常に低い携帯用物体、特にデジタル写真機と無線データ伝送手段を含む腕時計を提案することによって、上述の問題および欠点を克服することである。

【0006】

【課題を解決するための手段】したがって、本発明は、後でアナログ/デジタル変換器によってデジタル化され、次いでメモリ回路に記憶される画像用の写真機を含む低電力消費の携帯用物体であって、その携帯用物体に記憶された画像に対応するデジタルデータを処理すると共に遠隔電子受信装置へ無線送信するための電子モジュールをさらに含むことを特徴とする携帯用物体に関する。

【0007】本発明の特徴の結果、携帯用物体に記憶された画像に対応するデジタルデータを無線リンクを介して遠隔電子受信装置へ転送することができる。したがって、データ転送ワイヤを接続するためのコネクタを設ける必要がもはや無くなり、これにより、特に時計の場合には、完全な水密密封を達成することができる。コネクタが無いので、かなりの数の機械部品を省くことによって、そのような時計の構造を大幅に簡素化することができ、したがって固有の調整問題を回避することができる。さらに転送ケーブルは付属品であり、失なったり、忘れたりしやすいが、本発明の場合それを必要としないのでその心配がない。

【0008】携帯用物体に保存されたデータを無線リンクを介して転送することは、データの処理および無線伝送のための電子モジュールを構成する部品を注意深く選択することによって可能になる。この選択は、動作する最少の電力消費量を持つ電子モジュールを得ようとする望みによって導かれる。この目的のため、及び本発明の他の有利な特徴によれば、携帯用物体に記憶された画像に対応するデータの処理モジュールと無線伝送モジュールは、データのデジタル圧縮計算専用のアーキテクチャを有するデータ処理回路を含む。本発明の別の態様では、携帯用物体に記憶されたデータは、無線周波数リンクを介して、遠隔電子受信装置へ転送される。本発明の別の態様では、携帯用物体に記憶されたデータは、赤外線リンクを介して遠隔電子受信装置へ転送される。

【0009】

【発明の実施の形態】本発明の別の特徴および利点は、

添付の図面に関連して記述し、純粹に解説的であって非制限的な例として挙げる本発明の実施形態についての以下の説明を読むことにより、いっそう明らかになるであろう。本発明は、携帯用物体に記憶された画像に対応するデータの特定の周波数範囲の無線伝送に限定されない。さらに、以下の記述は時計、特に腕時計に関するが、本発明はそのような時計に限定されない。それは、一般的に1から10mAの範囲内の電流に対して電力消費が約5から50mWであり、中に写真機が配置され、その画像が最初にアナログ/デジタル変換器によってデジタル化され、次いでメモリに記憶される、その他のどんな携帯用物体にも容易に適用することができる。最後に、本発明は、携帯用物体に記憶されたどのような種類のデジタルデータの無線伝送にも、同様に適用することができる。

【0010】まず最初に図1について説明する。これは、全体を符号1で表した本発明に係る時計を示す。例えば腕時計型の時計1は、従来の方で、よく知られた射出成形技術に従って金属または塑性材料から形成されたケース2を含む。時計1は、ケース2内に収容され、かつそれぞれ時針および分針となり、文字盤8の上で運動する時間指示器4、6に結合された時計作動機構(図示せず)を含む。時計1は、クリスタルガラス10およびガラス縁12によって水密に作成される。ガラス縁は、例えば接着または超音波溶接によってケース2に固定的に取り付けられる。ケース2は、例えば時計1の時計作動機構のねじを巻くため、または時間指示器4、6の表示を調節するために、竜頭16を搭載した中間部14を含む。時計バンド22のストランド18、20は、従来同様、ケース2の中間部14に固定され、時計1を使用者の腕24に装着することを可能にする。

【0011】本発明では、図2に示すように、中間部14に、デジタル写真機30のレンズ組立体28を収容する開口部26がある。開口部26は、透明な材料、例えば有機ガラスから形成され、かつ時計1のケース2の完全な水密密封を確実にする前板32によって密封される。本発明の重要な特徴の1つは、図4に示すように、記憶された画像に対応するデジタルデータの処理および遠隔電子受信装置36への無線伝送のための電子モジュール34を時計1に含むことである。

【0012】図3に示すように、受信装置36は、時計1と例えばパーソナルコンピュータ38、プリンタ40、またはテレビモニタ42などの外部周辺装置との間のインタフェースを構成する。この受信装置36は、取り外して移動させることができる。それは、写真機30、および特に上記周辺装置38、40、または42の1つへのデジタルデータ伝送プロトコルのより簡単な管理を可能にするように意図されている。言うまでもなく、受信装置36は省くこともできる。そのような場合、時計1に記憶された画像に対応するデータは、伝送

されるデータを事前に周辺装置と互換可能な形式に変換することによって、選択された外部周辺装置38、40、または42へ直接伝送される。

【0013】例えば、竜頭16を回すことによって使用者はデジタル写真機30を制御することができる。図1に示すように、時計1の文字盤8はディスプレイセル44、46、48、50を有する。これらのセルは、写真機30の現在の動作モード、すなわち装置のスイッチがオンまたはオフになっているかどうか、次の写真を撮影する用意ができていないかどうか、すでに撮影された写真の連続表示モードになっているかどうか、あるいは時計1に記憶された画像に対応するデジタルデータの遠隔電子受信装置36への転送が開始したかどうかを使用者に示すことができる。文字盤8に形成された窓52には、撮影しようとしている場面の表示用、またはすでに撮影され一時的に時計1に記憶されている写真の連続表示用の電気光学ディスプレイセルDISPもある。

【0014】図4を参照すると、本発明に係る電子データ処理および無線伝送モジュール34を構成するさまざまな動作装置が示されている。本発明の第1の有利な特徴によると、デジタル写真機30の画像センサSENSは、COMOS技術を使用する。これは、センサSENSの各感光要素が、センサSENSによって出力されるアナログ信号の前処理を実行する特定の数のCMOSTランジスタを含むことを意味する。CMOSTランジスタを使用する集積回路は、非常に低い電力消費によって特徴付けられることを利点とし、CMOSTランジスタは、スイッチング中に電流を使用するだけであり、静止時の消費はそうしたランジスタの漏れ電流にまで減少される。センサSENSは、640×480画素の分解能を持つことが好ましい。各画素は256の濃度値を含み、8ビットで符号化される。

【0015】本発明の別の有利な特徴によると、画像センサSENSは、アナログリンクANALOGによってディスプレイセルDISPに接続される。この解決策は、ディスプレイセルDISPを従来の写真機のビューファインダのように使用するとき、電力消費を削減するのに役立つ。この解決策により、撮影しようとしている場面をディスプレイセルDISPに直接表示することができる。このアナログリンクANALOGが無ければ、撮影しようとしている各場面を事前にデジタル化し、次いでディスプレイセルDISPに表示する前にプロセッサによって処理しなければならない。そのようなプロセスが、電力消費の観点から不利であることは明白である。

【0016】写真の撮影中、画像センサSENSによって生成されたアナログ信号は、アナログ／デジタル変換器CAN1によってデジタルデータに変換される。次に、これらのデジタルデータは、例えば320Kバイトのデータ格納容量を有する好ましくはDRAM型のメモ

リMEM1に、一時的に格納される。本発明に係るデータ処理および無線伝送モジュール34はまた、時計1に記憶された画像に対応するデジタルデータの入力、処理および伝送プロセスの適正な作動を監視するマイクロプロセッサPROCESSをも含む。

【0017】本発明の特に有利な特徴によると、マイクロプロセッサPROCESSは、メモリMEM1に一時的に格納されたデータを、好ましくはマイクロプロセッサPROCESSと同一チップ上に形成され、かつデータのデジタル圧縮計算を確実にする専用アーキテクチャを有するデータ処理回路COMPに転送することができる。本発明のこの基本的構成は、電力消費の観点から非常に有利である。データデジタル圧縮は、同じ作業を確実にするために、多数の基本計算動作を実行しなければならない、したがってかなりの量の電流を使用するマイクロプロセッサによってではなく、低電力消費によって特徴付けられる専用補助回路によって実行することが好ましい反復作業を構成する。圧縮後、圧縮されたデジタルデータは、メモリMEM2に長期間格納することができる。このメモリはSRAM型、すなわち格納された情報を定期的に更新する必要の無い静的演算が可能であることが望ましい。より高価であるが、SRAMメモリは、電力消費がより低いので、DRAMメモリより好ましい。メモリMEM2は、例えば320Kバイトのデータ格納容量を有する。

【0018】時計1に格納された画像に対応するデータの遠隔電子受信装置36への転送を命令する前に、使用者は撮影した写真をディスプレイセルDISP上にまず表示することを希望することがある。そのような場合、メモリMEM2に格納された圧縮データはマイクロプロセッサPROCESSによって読み出され、部分的に圧縮解除され、最後にセルDISP上に表示するために、デジタル／アナログ変換器CAN2によってアナログ信号に変換される。従来の電気光学ディスプレイセルの場合、画面に表示されるデータは、そうしたデータを表す電荷をリフレッシュすることによって定期的に更新しなければならない、これは、データが変更されていない場合でもそうであることに気付かれるであろう。これは言うまでも無く、電力消費の観点から非常に不利である。本発明の好適な代替実施形態では、ディスプレイセルDISPが双安定またはメモリディスプレイと呼ばれる永久反射セルディスプレイであり、画面に表示されるデータが1つの場面から次の場面に移る間だけリフレッシュされる。

【0019】メモリMEM2に格納された圧縮データは、送信機TRANSMITTを介して遠隔電子受信装置36に転送される。この転送は、好ましくは27MHzの周波数の無線リンクにより約100kビット／秒のデータ転送速度で、または低速赤外線範囲の赤外線リンクにより約114kビット／秒のデータ転送速度で実行す

ることができる。本発明は、これらの特定の周波数範囲に限定されず、他のデータ伝送周波数を構想できることは明らかである。無線リンクの場合、時計1が金属で形成されているときは、時計1のクリスタルガラス10を通してデータ伝送を実行することが有利である。赤外線リンクの場合、データ伝送はクリスタルガラス10を通して、または写真機30のレンズ28を通して行うことができる。本発明の別の有利な特徴によれば、電子モジュール34は、遠隔電子装置36によって送信されたメッセージを受信するための受信機RECEIVを含むこともできる。これらは、特に、時計1からのデータ転送が完了したこと、およびそれが無事に行われたことを示す確認メッセージとすることができる。

【0020】本発明に係る電子データ処理および無線伝送モジュール34のさまざまな構成部品は従来通りに、処理されるデータおよびプログラム命令が通過するデータバスDATA BUS、およびアドレスレジスタのためにマイクロプロセッサPROCESSによって伝送されるアドレス信号が通過するアドレスバスADDRESS BUSによって、相互に接続される。様々な簡単な変化例や変形例が本発明の範囲内に入ることは明らかである。

【図面の簡単な説明】

【図1】 写真機と腕時計に記憶された画像に対応するデータの処理および無線伝送手段とを含む本発明実施形

態に係る腕時計の斜視図である。

【図2】 図1に示す腕時計の背面の斜視図である。

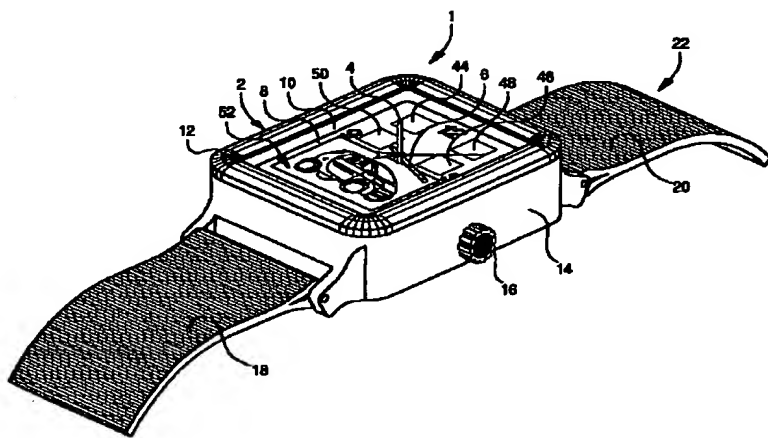
【図3】 本発明に係るデータ伝送システムの全体的構成図である。

【図4】 携帯用物体に記憶された画像に対応するデータの処理および無線伝送用の電子モジュールを構成するさまざまな装置の略図である。

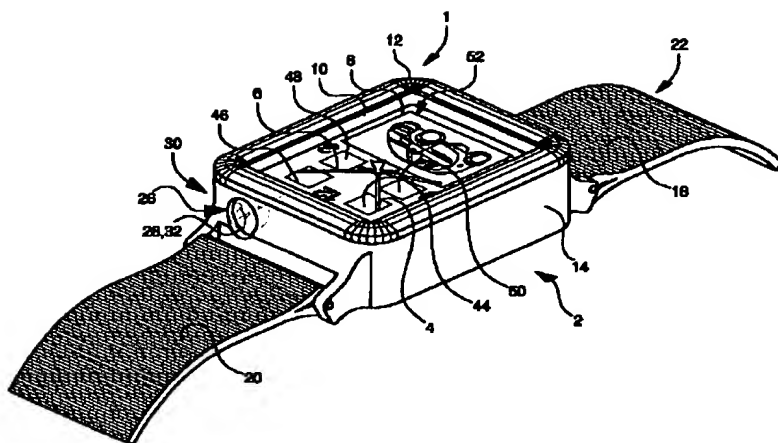
【符号の説明】

- | | |
|----|-----------|
| 1 | 時計 |
| 2 | ケース |
| 4 | 時間指示器(時計) |
| 6 | 時間指示器(分針) |
| 8 | 文字盤 |
| 10 | クリスタルガラス |
| 12 | ガラス縁 |
| 14 | 中間部 |
| 16 | 竜頭 |
| 22 | 時計バンド |
| 26 | 開口部 |
| 28 | レンズ組立体 |
| 30 | デジタル写真機 |
| 32 | 前板 |
| 34 | 電子モジュール |
| 36 | 遠隔電子受信装置 |

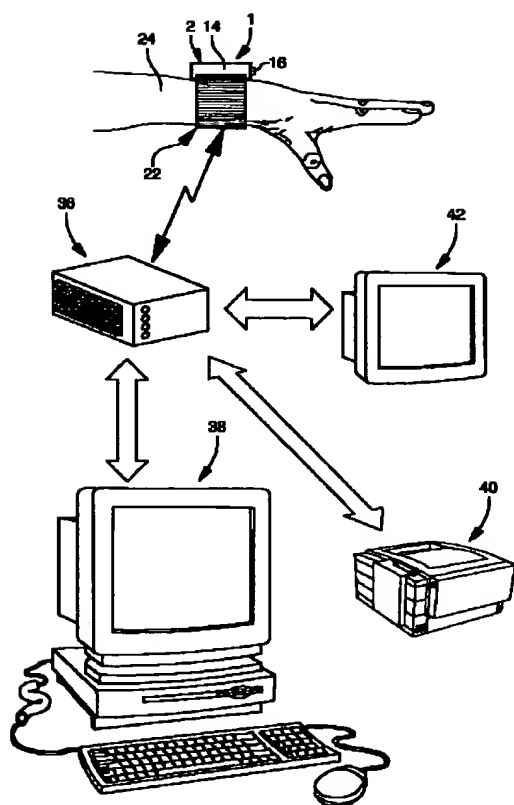
【図1】



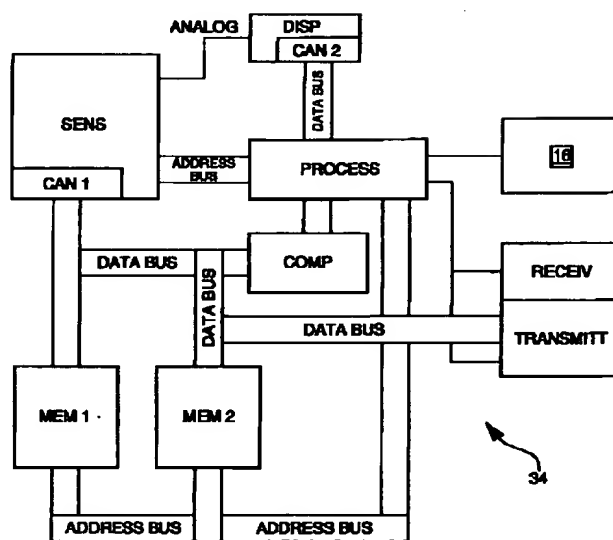
【図2】



【図3】



【図4】



フロントページの続き

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Burke

DERWENT-ACC-NO: 2000-087944

DERWENT-WEEK: 200126

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TITLE: Wrist watch equipped with digital
camera, has electronic
module that transmits digital data
processed
corresponding to stored image data,
to remote electronic
receiver

PATENT-ASSIGNEE: ASULAB SA[ASUL]

PRIORITY-DATA: 1998CH-0000325 (February 10, 1998)

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JP 2000050133 A		February 18, 2000	N/A
007	H04N 005/225		

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1999JP-0026096	February 3, 1999	

INT-CL (IPC): G03B029/00, G04G001/00 , H04B010/10 ,
H04B010/105 ,
H04B010/22 , H04N001/00 , H04N005/225

ABSTRACTED-PUB-NO: CN 1231434A

BASIC-ABSTRACT:

NOVELTY - A data processing circuit processes the digital
data corresponding to
image data stored in DRAM and SRAM. The electronic module

transmits the
processed data to remote electronic receiver (36).

USE - Wrist watch equipped with digital camera.

ADVANTAGE - The need of providing connector for connecting
data transmission
wire is eliminated. Offers low power consumption.

DESCRIPTION OF DRAWING(S) - The figure shows the entire
block diagram of data
transmission system.

Remote electronic receiver 36

ABSTRACTED-PUB-NO: JP2000050133A

EQUIVALENT-ABSTRACTS:

NOVELTY - A data processing circuit processes the digital
data corresponding to
image data stored in DRAM and SRAM. The electronic module
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data transmission
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DESCRIPTION OF DRAWING(S) - The figure shows the entire
block diagram of data
transmission system.


Remote electronic receiver 36

CHOSEN-DRAWING: Dwg.3/4 Dwg.3/4

TITLE-TERMS: WRIST WATCH EQUIP DIGITAL CAMERA ELECTRONIC
MODULE TRANSMIT
DIGITAL DATA PROCESS CORRESPOND STORAGE IMAGE
DATA REMOTE
ELECTRONIC RECEIVE

DERWENT-CLASS: P82 S04 W01 W02 W04

EPI-CODES: S04-B09; W01-A07H3; W02-C04B2; W02-C04B3;



W04-M01B1; W04-M01D9;
W04-M01X;

SECONDARY-ACC-NO:

Non-CPI Secondary Accession Numbers: N2001-168289

TITLE: PORTABLE OBJECT FOR LOW POWER
CONSUMPTION, ESPECIALLY WATCH HAVING CAMERA AND RADIO DATA
TRANSMITTING MEANS

CLAIMS

[Claim(s)]

[Claim 1] In order to take the photograph which it is digitized by the analog-to-digital converter (CAN1), and is memorized by the memory circuit (MEM1) In the portable body of the low power consumption containing the equipment (30) equipped with a lens assembly (28) and an image sensor (SENS) The portable body characterized by including the electronic module (34) for the radio transmissions to the processing of digital data and the remote electronic receiving set (36) corresponding to the image memorized by the portable body.

[Claim 2] The portable body according to claim 1 characterized by the processing of data and the radio-transmission module (34) corresponding to the image memorized by the portable body including the data-processing circuit (COMP) which has the exclusive architecture for ensuring digital compression count of data.

[Claim 3] A portable body given in any 1 term of claims 1-2 characterized by the digitized data being memorized by the memory circuit (MEM1, MEM2) of a DRAM mold and a SRAM mold, respectively.

[Claim 4] A portable body given in any 1 term of claims 1-3 characterized by including a display cel (DISP).

[Claim 5] The portable body according to claim 4 characterized by a display cel (DISP) being a memory reflective cel.

[Claim 6] A portable body given in any 1 term of claims 1-5 characterized by an image sensor (SENS) using a CMOS technology.

[Claim 7] A portable body given in any 1 term of claims 4-6 characterized by connecting an image sensor (SENS) to a display cel (DISP) through an analog link (ANALOG).

[Claim 8] A portable body given in any 1 term of claims 1-7 characterized by transmitting the data memorized by the portable body to a remote electronic receiving set (36) through a radio frequency link.

[Claim 9] The portable body according to claim 8 characterized by performing on the frequency whose transfer through the radio frequency link of the data memorized by the portable body is 27MHz.

[Claim 10] A portable body given in any 1 term of claims 1-7 characterized by transmitting the data memorized by the portable body to a remote electronic receiving set (36) through an infrared link.

[Claim 11] The portable body according to claim 10 characterized by performing the transfer through the infrared link of the data memorized by the portable body in the low-speed infrared range.

[Claim 12] A portable body given in any 1 term of claims 10 or 11 characterized by performing data transmission through the lens assembly (28) of a digital camera (30).

[Claim 13] A portable body given in any 1 term of claims 1-12 characterized by

including the receiver (RECEIV) for receiving the message to which an electronic module (34) is transmitted by the remote electronic instrument (36).

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to a clock including the portable body especially digital camera, and wireless data transmission means of low power consumption.

[0002]

[Description of the Prior Art] Generally the portable body of low power consumption means the portable body of the class of arbitration whose power consumption is about 5 to 50mW to the current of the range of 1 to 10mA. Clocks, such as a wrist watch including the case where the digital camera was held in the interior, are already known. Therefore, the wearer of such a clock can take the photograph of the person who had an available camera eternally, for example, met at scenery, a family's member, or the board on work. Once a photograph is taken, they will be digitized by the analog-to-digital converter and will be memorized by the memory circuit. The memorized photograph must be transmitted to a degree and it must transmit to a personal computer, i.e., PC, remote electronic processing and a receiving set, and conventionally. This transfer operation is performed by the electrical cable by which the end was connected to the clock and the other end was connected to PC. For example, an image transfer cable is connectable with the latter with ohmic contact performed by some clocks.

[0003] This solution has the advantage of being economical, from a viewpoint of power consumption. Wire connection transmission of the digital data corresponding to the photograph memorized by memory can be performed with a very low current. Furthermore, the electric power supply of a clock is securable by computer itself generally connected to the main power supply among this transfer operation. On the contrary, the main faults of wire transmission have ohmic contact required for connection of a transfer cable in the data of being very harmful, to sealing of a clock. Actually, opening is constituted, moisture, water, and dust invade into the case of a clock easily from there, and this contact spoils suitable actuation of a clock. Many examples of application transmitted to the computer which left the photograph memorized with the digital camera through the radio frequency link after waveform shaping of a picture signal are also known.

[0004] Serel which indicates as an example the safety system for cars which conveys people, such as a taxi The Europe patent No. 0680818 for which France applied can be quoted. In this system, the analog signal from a photograph camera is changed and compressed into digital data, and then is transmitted to a central taxi station by the radio transmitter. In the central office, a digital signal is caught by the radio set and decoded by the decoder arranged next at the output side of a receiver. Finally an image is displayed on a television monitor. This system can take that photograph, when a taxi picks up the PAX, and it is convenient. The photograph will be deleted, if transport is performed safely and the PAX pays a tariff. However, such communication system by the radio frequency electric wave has the fault of consuming the current of a large quantity. This explains why such a solution was not used for the portable body of the wrist watch mold with which reservation of power is restricted till today. In the case of a taxi, the cell of a car has the power storage capacity large enough which can secure the power source of a

camera and a radio frequency electric-wave data transmission means.

[0005]

[Problem(s) to be Solved by the Invention] The object of this invention is conquering an above-mentioned problem and an above-mentioned fault by proposing a portable body with very low power consumption especially a digital camera, and a wrist watch including a wireless data transmission means.

[0006]

[Means for Solving the Problem] Therefore, this invention is digitized by the analog-to-digital converter later, it is the portable body of the low power consumption containing the camera for images subsequently to a memory circuit memorized, and it relates to the portable body characterized by including further the electronic module for carrying out wireless transmission to a remote electronic receiving set while it processes the digital data corresponding to the image memorized by the portable body.

[0007] The digital data corresponding to the image memorized by the portable body can be transmitted to a remote electronic receiving set through a radio link as a result of the description of this invention. Therefore, the need of preparing the connector for connecting a data transfer wire is already lost, and, thereby especially in the case of a clock, perfect watertight sealing can be attained. Since there is no connector, by excluding most number of mechanical parts, the structure of such a clock can be simplified substantially, therefore the adjustment problem of a proper can be avoided. Furthermore, although it is an accessory and easy to forget by ~~*****~~(ing) a transfer cable, since it is not needed in the case of this invention, the worries do not exist.

[0008] It becomes possible to transmit the data saved on the portable body through a radio link by choosing carefully the components which constitute the electronic module for processing of data and a radio transmission. This selection is drawn by the wish which is going to obtain an electronic module with the minimum power consumption which can operate. According to other advantageous descriptions of this invention for this object, the processing module and radio-transmission module of data corresponding to the image memorized by the portable body include the data-processing circuit which has the architecture only for digital compression count of data. In another mode of this invention, the data memorized by the portable body are transmitted to a remote electronic receiving set through a radio frequency link. In another mode of this invention, the data memorized by the portable body are transmitted to a remote electronic receiving set through an infrared link.

[0009]

[Embodiment of the Invention] The another description and another advantage of this invention will become still clearer by describing in relation to an attached drawing and reading the following explanation about the operation gestalt of this invention purely mentioned as an explanatory and nonrestrictive example. This invention is not limited to the radio transmission of the specific frequency range of the data corresponding to the image memorized by the portable body. Furthermore, although the following description is related with a clock, especially a wrist watch, this invention is not limited to such a clock. Generally it is easily applicable to any portable bodies of others which power consumption is about 5 to 50mW, a camera is arranged in inside, and the image is first digitized by the analog-to-digital converter, and are memorized subsequently to memory to the current within the limits of 1 to 10mA. Finally, this invention is applicable to the

radio transmission of what kind of kind memorized by the portable body of digital data similarly.

[0010] Drawing 1 is explained first. This shows the clock concerning this invention which expressed the whole with the sign 1. For example, the clock 1 of a wrist watch mold is the conventional approach, and includes the case 2 formed from the metal or the plastic material according to the injection-molding technique known well. A clock 1 is held in a case 2, and serves as a hour hand and the minute hand, respectively, and contains the clock operation system (not shown) combined with the time amount indicators 4 and 6 which exercise on a dial face 8. A clock 1 is created by crystal glass 10 and the glass edge 12 watertight. A glass edge is attached in a case 2 fixed by adhesion or ultrasonic welding. A case 2 includes the pars intermedia 14 in which the crown 16 was carried, in order to wind the screw thread of the clock operation system of a clock 1, or in order to adjust the display of the time amount indicators 4 and 6. As usual, it is fixed to the pars intermedia 14 of a case 2, and the strands 18 and 20 of a watchband 22 make it possible to equip a user's arm 24 with a clock 1.

10 [0011] In this invention, as shown in drawing 2, there is opening 26 which holds the lens assembly 28 of the digital camera 30 in pars intermedia 14. Opening 26 is sealed by the dark room 32 which is formed from a transparent ingredient, for example, organic glass, and ensures perfect watertight sealing of the case 2 of a clock 1. One of the important descriptions of this invention is that the electronic module 34 for processing of the digital data corresponding to the memorized image and the radio transmission to the remote electronic receiving set 36 is included in a clock 1, as shown in drawing 4.

[0012] As shown in drawing 3, a receiving set 36 constitutes the interface between a clock 1 and external peripheral devices, such as a personal computer 38, a printer 40, or a television monitor 42. This receiving set 36 can be removed and moved. it -- a camera 30 -- and it has intention so that easier management of one digital data transmission protocol of the above-mentioned peripheral devices 38, 40, or 42 may be enabled especially.

Needless to say, a receiving set 36 can also be excluded. In such a case, the data corresponding to the image memorized by the clock 1 are directly transmitted to the selected external peripheral devices 38, 40, or 42 by changing the data transmitted into the format in which a peripheral device and transposition are possible in advance.

[0013] For example, a user can control the digital camera 30 by turning a crown 16. As shown in drawing 1, the dial face 8 of a clock 1 has the display cels 44, 46, 48, and 50. A user can be shown whether the transfer to the remote electronic receiving set 36 of the digital data corresponding to the image memorized by whether it is the continuation display mode of the photograph with which it was already photoed whether it is ready to take [whether the present mode of operation of a camera 30, i.e., the switch of equipment, is turned off / ON-or-/and-] the following photograph, and the clock 1 started these cels. There is an electro-optics display cel DISP the object for the display of the scene which it is going to photo, or for the continuation display of the photograph which is already taken and is temporarily memorized by the clock 1 in the aperture 52 formed in the dial face 8.

[0014] Reference of drawing 4 shows various equipments of operation which constitute electronic data processing and the radio-transmission module 34 concerning this invention. According to the 1st advantageous description of this invention, the image sensor SENS of the digital camera 30 uses a COMOS technique. This means that each

sensitization element of Sensor SENS contains a specific number of CMOS transistors which perform pretreatment of the analog signal outputted by Sensor SENS. It makes into an advantage to characterize the integrated circuit which uses a CMOS transistor by very low power consumption, a current is only used for a CMOS transistor during switching, and the consumption at the time of quiescence decreases even to the leakage current of such a transistor. As for Sensor SENS, it is desirable to have the resolution of 640x480 pixels. Each pixel is encoded by 8 bits including the concentration value of 256.

[0015] According to another advantageous description of this invention, the image sensor SENS is connected to the display cel DISP by the analog link ANALOG. This solution is useful to reducing power consumption, when using the display cel DISP like the viewfinder of the conventional camera. By this solution, the scene which it is going to photo can be displayed directly on the display cel DISP. If this analog link ANALOG does not exist, before digitizing in advance each scene which it is going to photo and displaying it subsequently to the display cel DISP, it must process by the processor. A disadvantageous thing has such a clear process from a viewpoint of power consumption.

[0016] The analog signal generated by the image sensor SENS is changed into digital data by analog-to-digital converter CAN1 during photography of a photograph. next, these digital data have the data storage capacity of 320 K bytes -- it is preferably stored in the memory MEM 1 of a DRAM mold temporarily. Data processing and the radio-transmission module 34 concerning this invention contain the microprocessor PROCESS which supervises the input of the digital data corresponding to the image memorized by the clock 1, processing, and proper actuation of a transmission process again.

[0017] According to the advantageous description of this invention, Microprocessor PROCESS can be especially transmitted to the data-processing circuit COMP which has the exclusive architecture which is preferably formed on the same chip as Microprocessor PROCESS in the data temporarily stored in memory MEM 1, and ensures digital compression count of data. This fundamental configuration of this invention is dramatically advantageous from a viewpoint of power consumption. In order that data digital compression may ensure the same activity, it is not by the microprocessor which must perform much basic count actuation, therefore uses most quantity of a current, and performing by the exclusive supplemental circuit characterized by low power consumption constitutes a desirable repetitive activity. The compressed digital data is storable in memory MEM 2 after compression for a long period of time. As for this memory, it is desirable for a static operation without the need of updating a SRAM mold, i.e., the stored information, periodically to be possible. Although it is more expensive, since power consumption is more low, SRAM memory is more desirable than DRAM memory. Memory MEM 2 has the data storage capacity of 320 K bytes.

[0018] Before ordering the transfer to the remote electronic television equipment 36 of the data corresponding to the image stored in the clock 1, a user may wish to display the taken photograph first on the display cel DISP. In such a case, the compressed data stored in memory MEM 2 is changed into an analog signal by digital to analog converter CAN2, in order for reading appearance to be carried out by Microprocessor PROCESS, and for compression discharge to be selectively carried out and to display on Cel DISP finally by it. In the case of the conventional electro-optics display cel, the data displayed on a screen must be periodically updated by refreshing the charge showing such data, and this comes out so and will be noticed by a certain thing, even when data are not changed.

There is this also until no says, and it is dramatically disadvantageous from a viewpoint of power consumption. With the suitable alternative implementation gestalt of this invention, the display cel DISP is the permanent reflective cel display called bistability or a memory display, and only while the data displayed on a screen move from one scene to the following scene, it refreshes.

[0019] The compressed data stored in memory MEM 2 is transmitted to the remote electronic receiving set 36 through Transmitter TRANSMITT. Preferably, this transfer is abbreviation 100k bits per second in data transfer rate by the radio link with a frequency of 27MHz, or can be performed with the data transfer rate of abbreviation 114k bits per second by the infrared link of the low-speed infrared range. It is clear that this invention's it is not limited to these specific frequency ranges, but can conceive of other data transmission frequencies. When the clock 1 is formed with the metal in the case of the radio link, it is advantageous to perform data transmission through the crystal glass 10 of a clock 1. In an infrared link, data transmission can let crystal glass 10 pass, or can perform it through the lens 28 of a camera 30. According to another advantageous description of this invention, an electronic module 34 can also contain the receiver RECEIV for receiving the message transmitted by the remote electronic instrument 36. Especially these can be made into the acknowledgement message which shows that the data transfer from a clock 1 was completed, and that it was performed safely.

[0020] data bus DATA through which boils various component parts of electronic data processing concerning this invention, and the radio-transmission module 34 as usual, and the data and program instruction which are processed pass Address bus ADDRESS through which the address signal transmitted by Microprocessor PROCESS for BUS and an address register passes BUS connects mutually. It is clear that easy various examples of change and modifications go within the limits of this invention.

TECHNICAL FIELD

[Field of the Invention] This invention relates to a clock including the portable body especially digital camera, and wireless data transmission means of low power consumption.

PRIOR ART

[Description of the Prior Art] Generally the portable body of low power consumption means the portable body of the class of arbitration whose power consumption is about 5 to 50mW to the current of the range of 1 to 10mA. Clocks, such as a wrist watch including the case where the digital camera was held in the interior, are already known. Therefore, the wearer of such a clock can take the photograph of the person who had an available camera eternally, for example, met at scenery, a family's member, or the board on work. Once a photograph is taken, they will be digitized by the analog-to-digital converter and will be memorized by the memory circuit. The memorized photograph must be transmitted to a degree and it must transmit to a personal computer, i.e., PC, remote electronic processing and a receiving set, and conventionally. This transfer operation is performed by the electrical cable by which the end was connected to the clock and the other end was connected to PC. For example, an image transfer cable is connectable with the latter with ohmic contact performed by some clocks.

[0003] This solution has the advantage of being economical, from a viewpoint of power consumption. Wire connection transmission of the digital data corresponding to the photograph memorized by memory can be performed with a very low current. Furthermore, the electric power supply of a clock is securable by computer itself generally connected to the main power supply among this transfer operation. On the contrary, the main faults of wire transmission have ohmic contact required for connection of a transfer cable in the data of being very harmful, to sealing of a clock. Actually, opening is constituted, moisture, water, and dust invade into the case of a clock easily from there, and this contact spoils suitable actuation of a clock. Many examples of application transmitted to the computer which left the photograph memorized with the digital camera through the radio frequency link after waveform shaping of a picture signal are also known.

[0004] Serel which indicates as an example the safety system for cars which conveys people, such as a taxi The Europe patent No. 0680818 for which France applied can be quoted. In this system, the analog signal from a photograph camera is changed and compressed into digital data, and then is transmitted to a central taxi station by the radio transmitter. In the central office, a digital signal is caught by the radio set and decoded by the decoder arranged next at the output side of a receiver. Finally an image is displayed on a television monitor. This system can take that photograph, when a taxi picks up the PAX, and it is convenient. The photograph will be deleted, if transport is performed safely and the PAX pays a tariff. However, such communication system by the radio frequency electric wave has the fault of consuming the current of a large quantity. This explains why such a solution was not used for the portable body of the wrist watch mold with which reservation of power is restricted till today. In the case of a taxi, the cell of a car has the power storage capacity large enough which can secure the power source of a camera and a radio frequency electric-wave data transmission means.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] The object of this invention is conquering an above-mentioned problem and an above-mentioned fault by proposing a portable body with very low power consumption especially a digital camera, and a wrist watch including a wireless data transmission means.

MEANS

[Means for Solving the Problem] Therefore, this invention is digitized by the analog-to-digital converter later, it is the portable body of the low power consumption containing the camera for images subsequently to a memory circuit memorized, and it relates to the portable body characterized by including further the electronic module for carrying out wireless transmission to a remote electronic receiving set while it processes the digital data corresponding to the image memorized by the portable body.

[0007] The digital data corresponding to the image memorized by the portable body can be transmitted to a remote electronic receiving set through a radio link as a result of the description of this invention. Therefore, the need of preparing the connector for connecting a data transfer wire is already lost, and, thereby especially in the case of a clock, perfect watertight sealing can be attained. Since there is no connector, by excluding most number of mechanical parts, the structure of such a clock can be simplified substantially, therefore the adjustment problem of a proper can be avoided. Furthermore, although it is an accessory and easy to forget by ***** (ing) a transfer cable, since it is not needed in the case of this invention, the worries do not exist.

[0008] It becomes possible to transmit the data saved on the portable body through a radio link by choosing carefully the components which constitute the electronic module for processing of data and a radio transmission. This selection is drawn by the wish which is going to obtain an electronic module with the minimum power consumption which can operate. According to other advantageous descriptions of this invention for this object, the processing module and radio-transmission module of data corresponding to the image memorized by the portable body include the data-processing circuit which has the architecture only for digital compression count of data. In another mode of this invention, the data memorized by the portable body are transmitted to a remote electronic receiving set through a radio frequency link. In another mode of this invention, the data memorized by the portable body are transmitted to a remote electronic receiving set through an infrared link.

[0009]

[Embodiment of the Invention] The another description and another advantage of this invention will become still clearer by describing in relation to an attached drawing and reading the following explanation about the operation gestalt of this invention purely mentioned as an explanatory and nonrestrictive example. This invention is not limited to the radio transmission of the specific frequency range of the data corresponding to the image memorized by the portable body. Furthermore, although the following description is related with a clock, especially a wrist watch, this invention is not limited to such a

clock. Generally it is easily applicable to any portable bodies of others which power consumption is about 5 to 50mW, a camera is arranged in inside, and the image is first digitized by the analog-to-digital converter, and are memorized subsequently to memory to the current within the limits of 1 to 10mA. Finally, this invention is applicable to the radio transmission of what kind of kind memorized by the portable body of digital data similarly.

[0010] Drawing 1 is explained first. This shows the clock concerning this invention which expressed the whole with the sign 1. For example, the clock 1 of a wrist watch mold is the conventional approach, and includes the case 2 formed from the metal or the plastic material according to the injection-molding technique known well. A clock 1 is held in a case 2, and serves as a hour hand and the minute hand, respectively, and contains the clock operation system (not shown) combined with the time amount indicators 4 and 6 which exercise on a dial face 8. A clock 1 is created by crystal glass 10 and the glass edge 12 watertight. A glass edge is attached in a case 2 fixed by adhesion or ultrasonic welding. A case 2 includes the pars intermedia 14 in which the crown 16 was carried, in order to wind the screw thread of the clock operation system of a clock 1, or in order to adjust the display of the time amount indicators 4 and 6. As usual, it is fixed to the pars intermedia 14 of a case 2, and the strands 18 and 20 of a watchband 22 make it possible to equip a user's arm 24 with a clock 1.

[0011] In this invention, as shown in drawing 2, there is opening 26 which holds the lens assembly 28 of the digital camera 30 in pars intermedia 14. Opening 26 is sealed by the dark room 32 which is formed from a transparent ingredient, for example, organic glass, and ensures perfect watertight sealing of the case 2 of a clock 1. One of the important descriptions of this invention is that the electronic module 34 for processing of the digital data corresponding to the memorized image and the radio transmission to the remote electronic receiving set 36 is included in a clock 1, as shown in drawing 4.

[0012] As shown in drawing 3, a receiving set 36 constitutes the interface between a clock 1 and external peripheral devices, such as a personal computer 38, a printer 40, or a television monitor 42. This receiving set 36 can be removed and moved. it -- a camera 30 -- and it has intention so that easier management of one digital data transmission protocol of the above-mentioned peripheral devices 38, 40, or 42 may be enabled especially.

Needless to say, a receiving set 36 can also be excluded. In such a case, the data corresponding to the image memorized by the clock 1 are directly transmitted to the selected external peripheral devices 38, 40, or 42 by changing the data transmitted into the format in which a peripheral device and transposition are possible in advance.

[0013] For example, a user can control the digital camera 30 by turning a crown 16. As shown in drawing 1, the dial face 8 of a clock 1 has the display cels 44, 46, 48, and 50. A user can be shown whether the transfer to the remote electronic receiving set 36 of the digital data corresponding to the image memorized by whether it is the continuation display mode of the photograph with which it was already photoed whether it is ready to take [whether the present mode of operation of a camera 30, i.e., the switch of equipment, is turned off / ON or / and] the following photograph, and the clock 1 started these cels. There is an electro-optics display cel DISP the object for the display of the scene which it is going to photo, or for the continuation display of the photograph which is already taken and is temporarily memorized by the clock 1 in the aperture 52 formed in the dial face 8.

[0014] Reference of drawing 4 shows various equipments of operation which constitute electronic data processing and the radio-transmission module 34 concerning this invention. According to the 1st advantageous description of this invention, the image sensor SENS of the digital camera 30 uses a CMOS technique. This means that each sensitization element of Sensor SENS contains a specific number of CMOS transistors which perform pretreatment of the analog signal outputted by Sensor SENS. It makes into an advantage to characterize the integrated circuit which uses a CMOS transistor by very low power consumption, a current is only used for a CMOS transistor during switching, and the consumption at the time of quiescence decreases even to the leakage current of such a transistor. As for Sensor SENS, it is desirable to have the resolution of 640x480 pixels. Each pixel is encoded by 8 bits including the concentration value of 256.

[0015] According to another advantageous description of this invention, the image sensor SENS is connected to the display cel DISP by the analog link ANALOG. This solution is useful to reducing power consumption, when using the display cel DISP like the viewfinder of the conventional camera. By this solution, the scene which it is going to photo can be displayed directly on the display cel DISP. If this analog link ANALOG does not exist, before digitizing in advance each scene which it is going to photo and displaying it subsequently to the display cel DISP, it must process by the processor. A disadvantageous thing has such a clear process from a viewpoint of power consumption.

[0016] The analog signal generated by the image sensor SENS is changed into digital data by analog-to-digital converter CAN1 during photography of a photograph. next, these digital data have the data storage capacity of 320 K bytes -- it is preferably stored in the memory MEM 1 of a DRAM mold temporarily. Data processing and the radio-transmission module 34 concerning this invention contain the microprocessor PROCESS which supervises the input of the digital data corresponding to the image memorized by the clock 1, processing, and proper actuation of a transmission process again.

[0017] According to the advantageous description of this invention, Microprocessor PROCESS can be especially transmitted to the data-processing circuit COMP which has the exclusive architecture which is preferably formed on the same chip as Microprocessor PROCESS in the data temporarily stored in memory MEM 1, and ensures digital compression count of data. This fundamental configuration of this invention is dramatically advantageous from a viewpoint of power consumption. In order that data digital compression may ensure the same activity, it is not by the microprocessor which must perform much basic count actuation, therefore uses most quantity of a current, and performing by the exclusive supplemental circuit characterized by low power consumption constitutes a desirable repetitive activity. The compressed digital data is storable in memory MEM 2 after compression for a long period of time. As for this memory, it is desirable for a static operation without the need of updating a SRAM mold, i.e., the stored information, periodically to be possible. Although it is more expensive, since power consumption is more low, SRAM memory is more desirable than DRAM memory. Memory MEM 2 has the data storage capacity of 320 K bytes.

[0018] Before ordering the transfer to the remote electronic television equipment 36 of the data corresponding to the image stored in the clock 1, a user may wish to display the taken photograph first on the display cel DISP. In such a case, the compressed data stored in memory MEM 2 is changed into an analog signal by digital to analog converter CAN2, in order for reading appearance to be carried out by Microprocessor PROCESS, and for

compression discharge to be selectively carried out and to display on Cel DISP finally by it. In the case of the conventional electro-optics display cel, the data displayed on a screen must be periodically updated by refreshing the charge showing such data, and this comes out so and will be noticed by a certain thing, even when data are not changed. There is this also until no says, and it is dramatically disadvantageous from a viewpoint of power consumption. With the suitable alternative implementation gestalt of this invention, the display cel DISP is the permanent reflective cel display called bistability or a memory display, and only while the data displayed on a screen move from one scene to the following scene, it refreshes.

[0019] The compressed data stored in memory MEM 2 is transmitted to the remote electronic receiving set 36 through Transmitter TRANSMITT. Preferably, this transfer is abbreviation 100k bits per second in data transfer rate by the radio link with a frequency of 27MHz, or can be performed with the data transfer rate of abbreviation 114k bits per second by the infrared link of the low-speed infrared range. It is clear that this invention's it is not limited to these specific frequency ranges, but can conceive of other data transmission frequencies. When the clock 1 is formed with the metal in the case of the radio link, it is advantageous to perform data transmission through the crystal glass 10 of a clock 1. In an infrared link, data transmission can let crystal glass 10 pass, or can perform it through the lens 28 of a camera 30. According to another advantageous description of this invention, an electronic module 34 can also contain the receiver RECEIV for receiving the message transmitted by the remote electronic instrument 36. Especially these can be made into the acknowledgement message which shows that the data transfer from a clock 1 was completed, and that it was performed safely.

[0020] data bus DATA through which boils various component parts of electronic data processing concerning this invention, and the radio-transmission module 34 as usual, and the data and program instruction which are processed pass Address bus ADDRESS through which the address signal transmitted by Microprocessor PROCESS for BUS and an address register passes BUS connects mutually. It is clear that easy various examples of change and modifications go within the limits of this invention.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the perspective view of the wrist watch concerning this invention operation gestalt including the processing of data and the radio-transmission means corresponding to the image memorized by the camera and the wrist watch.

[Drawing 2] It is the perspective view of the tooth back of the wrist watch shown in drawing 1 .

[Drawing 3] It is the overall block diagram of the data transmission system concerning this invention.

[Drawing 4] It is the schematic drawing of various equipments which constitute processing of the data corresponding to the image memorized by the portable body, and the electronic module for radio transmissions.

[Description of Notations]

1 Clock

2 Case

4 Time Amount Indicator (Hour Hand)

6 Time Amount Indicator (Minute Hand)

8 Dial Face

10 Crystal Glass

12 Glass Edge

14 Pars Intermedia

16 Crown

22 Watchband

26 Opening

28 Lens Assembly

30 Digital Camera

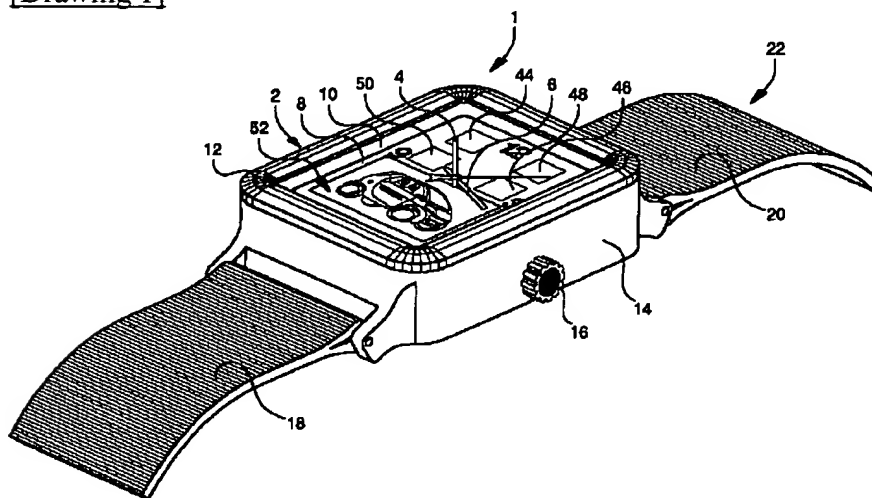
32 Dark Room

34 Electronic Module

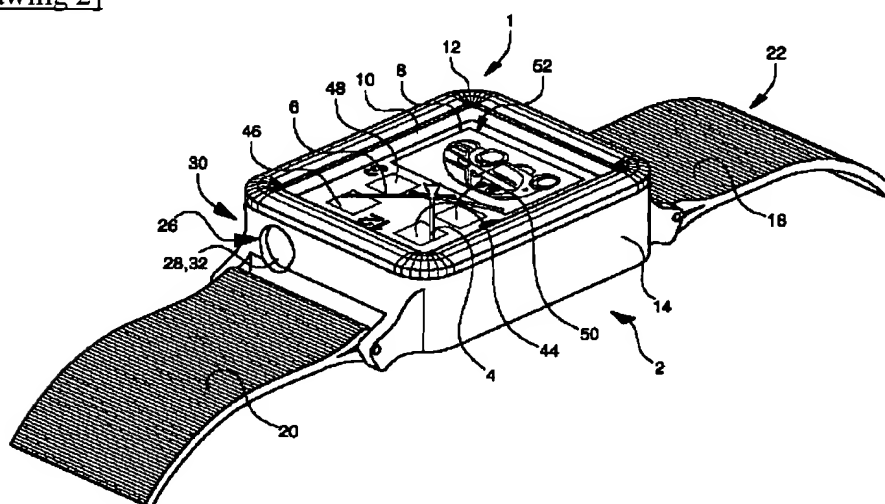
36 Remote Electronic Receiving Set

DRAWINGS

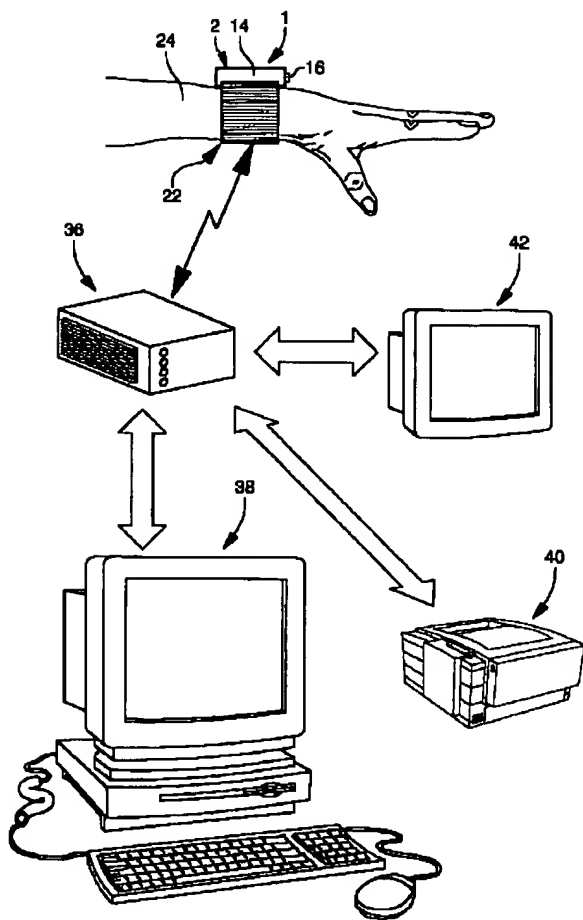
[Drawing 1]



[Drawing 2]



[Drawing 3]



[Drawing 4]

